

**Chittagong Veterinary and Animal Sciences University**

**Faculty of Food Science and Technology**

**FST 1<sup>st</sup> Year 1<sup>st</sup> Semester Final Examination 2011**

**Subject: Computer Science**

**Course Code: CSC-101**

**Full Marks: 70**

**Time: 3 Hours**

Figure in the right margin indicate full marks.

(Answer **FOUR** questions from each section where question no. 1 and 6 are compulsory. Use separate answer script for each section )

**Section: A**

- |    |    |  |   |
|----|----|--|---|
| 1. | a) | How would you define computers?  | 1 |
|    | b) | What are the types of software?  | 1 |
|    | c) | List the two most commonly used computer monitors?   | 1 |
|    | d) | What is the main difference between Impact and Non-Impact printers?                          | 1 |
|    | e) | What are the main two parts of a CPU?  | 1 |
| 2. | a) | Describe the main functional units of a computer system.                                     | 3 |
|    | b) | Note main features of 2 <sup>nd</sup> and 4 <sup>th</sup> generation computer.               | 4 |
|    | c) | Differentiate workstation from personal computer.  | 3 |
| 3. | a) | What is number system? Write down the Bases and Symbols used in different number system?     | 2 |
|    | b) | Construct a logic circuit for the Boolean expression $X = A \cdot \bar{B} + \bar{A} \cdot B$ | 3 |
|    | c) | Convert $25.7_{10}$ to Binary, Octal and Hexadecimal.  | 5 |
| 4. | a) | Define Aspect Ratio, Resolution and Dot pitch.   | 3 |
|    | b) | Explain how CRT monitor displays images.   | 4 |
|    | c) | Explain the differences between RAM and ROM. Identify two RAM technologies used in PC.       | 3 |
| 5. | a) | Describe how keyboard works.   | 3 |
|    | b) | Explain the process by which a leaser printer operates.                                      | 4 |
|    | c) | Explain how data is stored on the surface of optical disk.                                   | 3 |

**Section: B**

- |    |    |   |   |
|----|----|---|---|
| 6. | a) | What is an Operating System?  | 1 |
|    | b) | What is special about Linux ?   | 1 |
|    | c) | What do you mean by uploading and downloading?                                  | 1 |
|    | d) | What is programming language?   | 1 |
|    | e) | What is M-Commerce?   | 1 |
| 7. | a) | What are the differences between compiler and Interpreter?                      | 3 |
|    | b) | Write the functions of flowchart. Draw a flowchart for a cash register program. | 3 |
|    | c) | Explain the six phases in Program Development Life Cycle (PDLC)                 | 4 |



8.
  - a) Describe why operating system is necessary for a computer system? 3
  - b) Define Time-Sharing system. List some advantages of time sharing system. 3
  - c) Describe Operating System roles in running software programs. 4
  
9.
  - a) Differentiate between LAN and WAN. Identify three common network topologies. 3
  - b) Explain a modem's function. Write the criteria that should consider when choosing a modem. 3
  - c) Write short notes on NIC and FTP. 4
  
10.
  - a) What do you mean by Database Management System? Write some application of Database. 3
  - b) What do you mean by E-Commerce? Write some advantages and disadvantages of E-Commerce. 3
  - c) Describe how E-Commerce works. 4



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**Chittagong Veterinary and Animal Sciences University**  
**Faculty of Food Science and Technology**  
**FST 1<sup>st</sup> Year 1<sup>st</sup> Semester Final Examination 2011**  
**Subject: Inorganic Chemistry**  
**Course Code: ICM-101**

**Full Marks: 70**

**Time: 3 Hours**

Figure in the right margin indicate full marks.  
(Answer **FOUR** questions from each section where question no. 1 and 6 are compulsory. Use separate answer script for each section )

**Section: A**

- |    |    |  |       |
|----|----|--|-------|
| 1. | a) | What is Zeeman effect?   | 2     |
|    | b) | Define primary and Secondary standard substance with at least three examples.  | 3     |
| 2. | a) | Discuss the Bohr's model for hydrogen like atoms.  | 6     |
|    | b) | Write a note on Hund's rule of maximum multiplicity.   | 4     |
| 3. | a) | Define polarization of ions. Discuss the factors that affecting the polarization of an anion.                            | 1+5=6 |
|    | b) | Discuss the properties of the ionic compounds.   | 3     |
|    | c) | Indicate different types of bond present in $\text{Ag}(\text{NH}_3)_2\text{Cl}$ .  | 1     |
| 4. | a) | How can you prepare buffer solution? Discuss the mechanism of a basic buffer solution.                                   | 2+3=5 |
|    | b) | Describe the buffer action that controls the $\text{P}^{\text{H}}$ of the cytoplasm and blood.                           | 3     |
|    | c) | Calculate the $\text{P}^{\text{H}}$ of a Solution of household ammonia whose $[\text{OH}^-]$ is $7.12 \times 10^{-3}$ M. | 2     |
| 5. | a) | What are the defects of long form of periodic table?   | 4     |
|    | b) | State the position of s, p, d and f block elements in the modern periodic table and discuss their characteristics.       | 6     |

**Section: B**

- |    |    |  |   |
|----|----|--|---|
| 6. | a) | Write down the electron configuration of the following two atoms: Cr (24) and Ag(47).                        | 2 |
|    | b) | Determine the position of element having the following atomic numbers in the periodic table i)7 ii)19 iii)29 | 3 |
| 7. | a) | Classify the Lewis acids with example.   | 4 |
|    | b) | Define oxidation and reduction according to electronic theory.   | 6 |
| 8. | a) | Describe the single beam atomic absorption Spectrophotometer with a line diagram.                            | 7 |
|    | b) | What do you mean by Iodimetry and Iodometry? Give example.   | 3 |
| 9. | a) | Explain that- Ice has less density than water.   | 4 |
|    | b) | Show that electron affinity is periodic function.  | 3 |



- c) Determine the following solution are acidic, basic or neutral  
i) NaCl (ii) Na<sub>2</sub>CO<sub>3</sub> (iii) CuSO<sub>4</sub>

3

10. Write short notes on any **five** of the followings

- i) Hydrogen bond
- ii) Ionization energy
- iii) Limitation of Bohr's atomic model
- iv) Chromatography
- v) P<sup>H</sup> and P<sup>OH</sup> of solutions
- vi) Common ion effect

5x2=10



Figure in the right margin indicate full marks.

(Answer **FOUR** questions from each section where question no. 1 and 6 are compulsory. Use separate answer script for each section )

**Section: A**

1. a) Define vapour pressure, surface tension and viscosity. 3  
b) What is the effect of temperature on vapour pressure and viscosity? 2
2. a) What are the colligative properties of a solution? 2  
b) How can you determine the molecular weight of a solute from elevation of boiling point? 5  
c) The vapour pressure of ether (MW=74) is 442 mmHg at 293K. 3g of compound A are dissolved in 50g ether and the vapour pressure reduce to 426 mm Hg. Calculate the molecular weight of A. Assume that the solution is very dilute. 3
3. a) Define specific conductance and molar conductance. 3  
b) What is the Kohlrausch's Law of independent ionic mobilities? Write down its applications. 2+1  
c) Why the mobility of hydrogen and hydroxyl ions in aqueous solution is abnormally high? 4
4. a) Explain the term enthalpy. 4  
b) Describe in details the term 'molar heat capacity'. Prove that  $C_p$  is greater than  $C_v$  thermodynamically. 3+3
5. a) Describe a dispersion method for the preparation of sols with a neat diagram. 4  
b) Discuss a purification process of sols with the help of a diagram. 4  
c) Define Gel and Emulsion. 2

**Section: B**

6. a) Describe the various types of thermodynamic process. 5
7. a) What do you mean by chemical equilibrium? 2  
b) Deduce the relation between free energy change and equilibrium constant. 5  
c) At 333°C, 35% HI is decomposed. Calculate the  $K_c$  and  $K_p$  of this decomposition reaction. 3
8. a) What do you mean by half reaction? 2  
b) Describe the hydrogen electrode with a neat diagram. 4  
c) What is the potential of a half cell consisting Zinc electrode in 0.02 M  $ZnSO_4$  solution at 25°C ( $E^\circ = 0.763$  V). 4



9. a) Explain exothermic and endothermic reaction with the help of diagram. 4  
b) Define heat of formation and heat of combustion. 2  
c) Calculate the heat of formation of propane ( $C_3H_8$ ), if its heat of combustion is -2220.2 KJ/mol. The heat of formation of  $CO_2(g)$  and  $H_2O(l)$  are -393.5 and -285.8 KJ/mol respectively. 4
10. a) Define ionic product of water. 1  
b) Write short notes on any **THREE** of the following: 3x3=9  
(i) Oswald's dilution law.  
(ii) Theories of semi permeable membrane.  
(iii) Optical properties of sols.  
(iv) Faraday's law of electrolysis.  
(v) Hess's law of constant heat summation.



Chittagong Veterinary and Animal Sciences University

Faculty of Food Science and Technology

FST 1<sup>st</sup> Year 1<sup>st</sup> Semester Final Examination 2011

Subject: Mathematics-I

Course Code: MTH-101

Full Marks: 70

Time: 3 Hours

Figure in the right margin indicate full marks.

(Answer FOUR questions from each section where question no. 1 and 6 are compulsory. Use separate answer script for each section )

Section: A

1. a) Find the nature of the roots of the equation  $3x^4 + 12x^2 + 5x - 4 = 0$  1  
b) Write down the order and degree of the following differential equations 2  
i)  $x^2 \left(\frac{d^2y}{dx^2}\right)^3 + y\left(\frac{dy}{dx}\right)^4 + y^4 = 0$   
ii)  $\left[1 + \left(\frac{dy}{dx}\right)^2\right]^3 = \left(\frac{d^2y}{dx^2}\right)^2$   
c) If A has 32 elements, B has 42 elements and  $A \cup B$  has 62 elements, determine the number of elements  $A \cap B$  2
2. a) If  $\alpha, \beta, \gamma$  are the roots of the equation  $x^3 - ax^2 + bx - c = 0$ , form an equation whose roots are  $\beta\gamma + \frac{1}{\alpha}, \gamma\alpha + \frac{1}{\beta}, \alpha\beta + \frac{1}{\gamma}$  4  
b) Find the inverse of the matrix 4  
$$A = \begin{pmatrix} 2 & 5 & 5 \\ -1 & -1 & 0 \\ 2 & 4 & 3 \end{pmatrix}$$
  
c) Define identity matrix and orthogonal matrix with example. 2
3. a) Find the volume of the parallelepiped if  $\vec{a} = -3\hat{i} + 7\hat{j} + 5\hat{k}, \vec{b} = -3\hat{i} + 7\hat{j} - 3\hat{k}$  and  $\vec{c} = 7\hat{i} - 5\hat{j} - 3\hat{k}$  are the three co-terminous edges of the parallelepiped 5  
b) Write down the physical meaning of gradient divergence and curl 2  
c) Evaluate  $\iiint_S (3x\hat{i} + 2y\hat{j})$  where S is the sphere  $x^2 + y^2 + z^2 = 9$  3
4. a) State De Moivre's theorem. Derive it from Euler's exponential theorem 4  
b) Solve the equation  $x^5 + x^4 + x^3 + x^2 + x + 1 = 0$  with the help of De Moivre's theorem. 4  
c) Write down the difference between matrix and vector. 2
5. a) Define order and degree of a differential equation. Obtain the differential equation of which  $y^2 = 4a(x + a)$  is a solution. 3



- b) Solve the following differential equations ( any two)
- (i)  $(xy^2 + x)dx + (yx^2 + y)dy = 0$
  - (ii)  $2x^2 dy - (x^2 + y^2)dx = 0$
  - (iii)  $\frac{dy}{dx} + y = x$

**Section: B**

- |     |  |                  |
|-----|--|------------------|
| 6.  | <ul style="list-style-type: none"> <li>a) Define Beta and Gamma function.</li> <li>b) Write down the Walli's formula.</li> <li>c) Define Taylor's Series.</li> <li>d) Find the area of the parabola <math>y^2 = 4x, 0 \leq x \leq 1</math></li> </ul>  | 1<br>1<br>1<br>2 |
| 7.  | <ul style="list-style-type: none"> <li>a) Differentiate <math>\tan^{-1} \frac{2x}{1-x^2}</math> with respect to <math>\sin^{-1} \frac{2x}{1+x^2}</math></li> <li>b) If <math>x = a(\theta + \sin \theta), y = a(1 - \cos \theta)</math> find <math>\frac{dy}{dx}</math></li> <li>c) State Leibnitz theorem. If <math>y = e^{\sin^{-1} x}</math> then show that <math>(1-x^2)y_{n+2} - (2n+1)xy_{n+1} - (n^2+4)y_n = 0</math></li> </ul>  | 3<br>2<br>5      |
| 8.  | <ul style="list-style-type: none"> <li>a) Define with figure of increasing and decreasing function. The cost C of manufacturing a certain article is given by the formula                             <math display="block">C = 5 + \frac{48}{x} + 3x^2</math>                             where x is the number of articles manufactured. Find the minimum value of C.                         </li> <li>b) Integrate the following ( any two)                             <ul style="list-style-type: none"> <li>(i) <math>\int \frac{dx}{x^2 \sqrt{4-x^2}}</math></li> <li>(ii) <math>\int \tan^{-1} x dx</math></li> <li>(iii) <math>\int_0^{2a} \sqrt{2ax-x^2} dx</math></li> </ul> </li> </ul> | 5<br>5           |
| 9.  | <ul style="list-style-type: none"> <li>a) Show that <math>\int_0^{\pi/2} \log \sin x dx = \int_0^{\pi/2} \log \cos x dx = \frac{\pi}{2} \log(1/2)</math></li> <li>b) Find the area of the region enclosed by <math>x = y^2</math> and <math>y = x - 2</math></li> </ul>  | 5<br>5           |
| 10. | <ul style="list-style-type: none"> <li>a) Show that <math>ax^2 + 2hxy + by^2 = 0</math> homogeneous quadratic equation represents a pair of straight lines through the origin.</li> <li>b) Show that the equation <math>3y^2 - 8xy - 3x^2 - 29x + 3y - 18 = 0</math> represents two straight lines. Find also the angle between them.</li> </ul>   | 5<br>5           |



Chittagong Veterinary and Animal Sciences University

Faculty of Food Science and Technology

FST 1<sup>st</sup> Year 1<sup>st</sup> Semester Final Examination 2011

Subject: Physics- I

Course Code: PHC-101

Full Marks: 70

Time: 3 Hours

Figure in the right margin indicate full marks.  
(Answer **FOUR** questions from each section where question no. 1 and 6 are compulsory. Use separate answer script for each section )

**Section: A**

- |    |   |   |
|----|---|---|
| 1. | a) Define Elastic and Plastic body.   | 1 |
|    | b) What do you mean by surface force?   | 1 |
|    | c) State Hooke's law and define Elastic constants.  | 2 |
|    | d) Describe Fugitive elasticity.  | 1 |
| 2. | a) What is poisson's ratio? Show that the value of poisson's ratio lies between -1 and 0.5.   | 4 |
|    | b) Define Young's modulus and bulk modulus. Prove that for a homogeneous and isotropic medium, $Y = 3K(1 - 2\sigma)$ where Y denotes Young's modulus, K bulk modulus and $\sigma$ poisson's ratio.                              | 6 |
| 3. | a) Define surface tension and angle of contact.   | 3 |
|    | b) Find an expression for the excess pressure within a spherical soap bubble. Give a rough estimate of the energy of the bubble.  | 5 |
|    | c) Calculate the poisson's ratio for a material given that $Y = 12.25 \times 10^{10} \text{ N/m}^2$ and $\eta = 4.55 \times 10^{10} \text{ N/m}^2$ where Y, $\eta$ represent Young's modulus, modulus of rigidity respectively. | 2 |
| 4. | a) What do you mean by viscosity? Define the unit in which coefficient of viscosity is expressed.   | 3 |
|    | b) Derive an expression for the rate of flow of a viscous liquid through a capillary tube.  | 7 |
| 5. | a) Describe three different types of energy of a liquid in motion.  | 3 |
|    | b) Derive Bernoulli's theorem.  | 7 |

**Section: B**

- |    |   |   |
|----|---|---|
| 6. | a) Give the mathematical form of the first law of thermodynamics.   | 1 |
|    | b) What are the transverse and longitudinal waves?  | 1 |
|    | c) What are the fundamental postulates of kinetic theory of gases?  | 3 |
| 7. | a) Describe different types of thermodynamic process.   | 2 |
|    | b) Show that for a perfect gas $PV^\gamma = \text{constant}$ where the symbols have their usual meanings.                           | 5 |
|    | c) A perfect gas at 27° C is suddenly compressed to 8 times its original pressure. Find its rise in temperature if $\gamma = 1.5$ . | 3 |



8. a) Describe Carnot cycle. Obtain expressions for the work done in each operation of the cycle and the net work done in the cycle. 7  
b) Calculate the amount of work done by an ideal gas at constant temperature. 3
9. a) Explain what do you mean by the entropy of a substance? Show that for a reversible cyclic change, the total change of entropy is zero. Explain why this statement is not true for irreversible changes. 6  
b) Define mean free path. What is the mean free path  $\lambda$  for oxygen molecule at temperature  $T=300\text{K}$  and pressure  $p=1\text{ atm}$ ? Assume that the molecular diameter is  $d=290\text{ pm}$  and the gas is ideal. 4
10. a) Establish the differential equation for plane progressive wave. 4  
b) Show that Doppler effect is greater when the source approaches a stationary observer than when the observer approaches the stationary source with the same speed. 6



Figure in the right margin indicate full marks.

(Answer **FOUR** questions from each section where question no. 1 and 6 are compulsory. Use separate answer script for each section. Split answer is not allowed)

### Section: A

1. a) Explain the term "Enthalpy". 2  
b) Differentiate true solution, colloidal solution and suspension. 3
2. a) What is thermodynamical equilibrium constant? Derive the expression showing the effect of temperature on chemical equilibrium. 6  
b) The equilibrium constant  $K_p$  for the reaction  $2\text{NH}_3(\text{g}) = 3\text{H}_2(\text{g}) + \text{N}_2(\text{g})$  is  $1.22 \times 10^{-3}$  at 297K and 2.16 at 498K. Calculate  $\Delta H$  for the reaction. 4
3. a) Write a short definition of each of the following terms: i) Rate of a reaction; ii) Order of a reaction; iii) Molecularity of a reaction; iv) Half-life 4  
b) Deduce the rate expression for second-order reaction. 4  
c) The half-life of a substance in a first order reaction is 15 minutes. Calculate the rate constant. 2
4. a) What are colloids? 2  
b) Describe one method for the preparation of colloids with a neat diagram. 5  
c) What is meant by peptization? Give a suitable example. 3
5. a) Write down short notes on: i) Hess's law of constant heat summation; ii)  $K_c$  and  $K_p$  6  
b) Given that energies for H-H, O=O and O-H bonds are 104, 118 and 111 Kcalmol<sup>-1</sup>, respectively. Calculate the heat of reaction:  $\text{H}_2(\text{g}) + \frac{1}{2}\text{O}_2(\text{g}) \longrightarrow \text{H}_2\text{O}(\text{g})$  4

### Section: B

6. a) Define surface tension. What is the effect of temperature on surface tension? 3  
b) What is common ion effect? 2
7. a) How can you determine the molecular weight of a solute from elevation of boiling point? 5  
b) Write down the Raoult's law of depression of freezing point? 2  
c) The vapour pressure of ether (MW=74) is 442 mmHg at 293K. 3g of the compound 'A' is dissolved in 50g of ether and the vapour pressure is reduced to 426 mmHg. Calculate the mol mass of 'A'. Assume that the solution is very dilute. 3
8. a) Define molar conductance, equivalent conductance and specific conductance. What are the effects of concentration on them? 6  
b) Define osmosis and dialysis. Write down the biological importance of osmosis. 4
9. a) Discuss in details the Faradays law of electrolysis. 5  
b) Write down the Arrhenius theory of electrolytic dissociation. 3  
c) Why the mobilities of hydrogen ion and hydroxyl ion in aqueous solution is abnormally high. 2
10. a) Derive the relation between emf and free energy. 5  
b) What is buffer solution? Write down the mechanism of acidic and basic buffer solution. 5